

## WHAT IS CLAIMED IS:

1. A vaccine composition for immunizing an animal against infection by *Mycoplasma hyopneumoniae* which comprises  
an immunizing amount of *Mycoplasma hyopneumoniae* bacterin;  
an adjuvant mixture comprising an acrylic acid polymer and a mixture of a  
5 metabolizable oil and a polyoxyethylene-polypropylene block copolymer; and  
a pharmaceutically acceptable carrier which vaccine composition after a  
single administration elicits protective immunity from *Mycoplasma hyopneumoniae*.
2. The vaccine composition of claim 1, wherein the adjuvant mixture  
consists of an acrylic acid polymer and a mixture of a metabolizable oil that  
10 comprises one or more terpene hydrocarbons and a polyoxyethylene-polypropylene  
block copolymer in a ratio of about 1:25 to 1:50 of acrylic acid polymer to  
metabolizable oil/ polyoxyethylene-polypropylene block copolymer mixture.
3. The vaccine composition of claim 1 wherein the adjuvant mixture  
comprises about 1-25% v/v of the vaccine composition.
- 15 4. The vaccine composition of claim 3 wherein the acrylic acid polymer is  
present in a final concentration of about 1% v/v and the terpene hydrocarbons/  
polyoxyethylene-polypropylene block copolymer mixture is present in a final  
concentration of about 5% to 10% v/v.
5. The vaccine composition of claim 3, wherein the adjuvant mixture  
20 comprises about 2% - 15% v/v of the vaccine composition.
6. The vaccine composition of claim 5, wherein the adjuvant mixture  
comprises about 5% -12% v/v of the vaccine composition.
7. The vaccine composition of claim 1, wherein the metabolizable oil is  
squalane or squalene.
- 25 8. The vaccine composition of claim 6 or claim 7, wherein the acrylic  
acid polymer is Carbopol.
9. The vaccine composition of any of claims 1-8, further comprising at  
least one bacterin selected from the group consisting of *Haemonphilus parasuis*,

*Pasteurella multocida*, *Streptococcus suis*, *Actinobacillus pleuropneumoniae*,  
*Bordetella bronchiseptica*, *Salmonella choleraesuis* and leptospira bacteria.

10. A method for protecting an animal against disease caused by  
*Mycoplasma hyopneumoniae* comprising the step of administering to said animal a  
5 vaccine composition which comprises

an immunizing amount of a *Mycoplasma hyopneumoniae* bacterin;  
an adjuvant mixture comprising an acrylic acid polymer and a mixture of  
metabolizable oil and a polyoxyethylene-polypropylene block copolymer; and  
a pharmaceutical acceptable carrier which vaccine composition, after a single  
10 administration elicits protective immunity from *Mycoplasma hyopneumoniae*  
infection.

11. The method of claim 10, wherein the immunizing amount of said  
bacteria is about  $1 \times 10^8$  to  $3 \times 10^{11}$  MHDCE/mL.

12. The method according to claim 11 wherein the immunizing amount of  
15 said bacteria is about  $1 \times 10^9$  to  $3 \times 10^9$  MHDCE/mL.

13. The method of claim 10, wherein the mode of administration of said  
administering step is intramuscular, subcutaneous, intraperitoneal, aerosol, oral or  
intranasal.

14. The method of claim 10, wherein the adjuvant mixture consists of an  
20 acrylic acid polymer and a mixture of metabolizable oil that comprises one or more  
terpene hydrocarbons and a polyoxyethylene-polypropylene block copolymer present  
in a final concentration of about 1-25% v/v.

15. The method of claim 14, wherein the acrylic acid polymer of the  
adjuvant mixture is Carbopol.

25 16. The method of claim 14, wherein the metabolizable oil of the adjuvant  
mixture is a terpene hydrocarbon selected from the group of squalene and  
squalene.

17. The method of any claims 10-16, further comprising coadministering  
at least one additional bacterin selected from the group consisting of *Haemophilus*  
30 *parasuis*; *Pasteurella multocida*; *Streptococcus suis*; *Actinobacillus*  
*pleuropneumoniae*; *Bordetella bronchiseptica*; *Salmonella choleraesuis*; and  
leptospira bacteria.

18. A vaccine comprising inactivated *Mycoplasma hyopneumoniae*, a metabolizable oil, a polyoxyethylene-polypropylene block copolymer and an acrylic acid polymer in the form of an oil in water emulsion.